Why are price stability and statutory independence of central banks negatively correlated?

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Why are Price Stability and Statutory Independence of Central Banks Negatively Correlated?: The Role of Culture

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Som-Theme E Financial markets and institutions

Abstract
This paper investigates whether in OECD-countries the negative relation between central bank independence and inflation is related to culture, in the sense of common values and norms. It appears that inflation is lower in countries where people dislike uncertainty. The tolerance in a society with regard to inequality in power and wealth and in centralization of authority is correlated with central bank independence and to a lesser extent with inflation. Countries, where inhabitants perceive that there should be an order of inequality and a centralisation of authority, are characterised by a dependent central bank and relatively high inflation rates. Hence, the national attitude towards inequality among people is the third factor explaining the negative correlation between inflation and the degree of central bank independence.

This version: April 2001
Classification: E31, E52

Keywords: inflation, central bank independence, culture, institutions

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1. Introduction

By now there is overwhelming empirical evidence (surveyed in Berger et al., 2000 and Eijffinger and De Haan, 1996) supporting the proposition that in cross-country analyses an independent central bank (measured by an index of legal independence) and low rates of inflation are negatively correlated. Until recently this correlation was assumed to confirm a causal relation from central bank independence to inflation rates.

This causal relation running from central bank independence to inflation performance has come under attack. It has been suggested that the negative correlation between inflation and central bank independence is caused by a third factor. Candidates for this third factor are the opposition of the financial sector against inflation (Posen, 1995), the nation's degree of inflation aversion (Debelle, 1996), social cohesion (Prast, 1997), nation wide consensus (De Grauwe, 1998), and culture and tradition of monetary stability (Berger et al., 2000 and Eijffinger and De Haan, 1996). Empirical analysis has been restricted to a large number of investigations of the influence of central bank independence on inflation and a few studies on the determinants of central bank independence (see for example, De Haan and Van 't Hag, 1995; and Eijffinger and Schaling, 1996, Moser, 1999).

As far as I know, only three empirical studies (Posen, 1995; Hayo, 1998; and Moser, 1999) take the suggestion seriously that inflation and central bank independence are (partly) determined by the same set of variables. In Posen's study, this third factor is the effective financial opposition to inflation. A crucial assumption of his approach is that the financial sector dislikes inflation. Posen claims that the bankers' vulnerability to inflation is well established, although he admits that this attitude is not yet fully explained (Posen, 1995, p. 257). On the contrary, recent studies find a positive (though not always significant) relation between the net interest margin and bank profitability on the one hand and inflation on the other (Demirgüc-Kunt and Huizinga (1998, pp. 19 and 20). Van Lelyveld (2000, Chapter 7), therefore, estimates the country specific influence

of inflation on the commercial banks' profitability. This sensitivity to inflation is regarded as the banks' preference for inflation and is used for improving the index of Financial Opposition to Inflation (FOI). This 'true' FOI is strongly correlated with inflation. Van Lelyveld interprets this empirical result as that a high level of inflation forms an incentive for banks to lobby for a dependent central bank. Just the opposite causal direction as put forward by Posen. Moreover, De Haan and Van't Hag (1995) finds only mixed support for Posen's hypotheses.

Hayo (1998) introduces the concept of an inflation-culture, which in his view leads to a national consensus on price stability and central bank independence. This inflation culture will be the result of a historical feedback process where inflation aversion and central bank independence reinforce each other. Hayo approximates inflation aversion by means of the sensitivity of people's preference for low inflation to changes in the actual level of inflation. Various issues of the Eurobarometer are used for estimating this sensitivity[1]. It appears that the proxies of inflation aversion have a significant negative correlation with inflation. "The indicators of economic and political independence of the central banks are positively correlated with the estimated sensitivity parameters. In most cases, tough, this correlation is not significant" (Hayo, 1998, p. 258). His approach has two drawbacks. First, due to data limitations the analysis is restricted to European countries and partial correlations. Second, his paper does not provide a theory, which explains why in one country the historical feedback process leads to low inflation and an independent central bank and in the other to high inflation and a dependent central bank.

Moser (1999) argues that the level of independence of the central bank is related to the (non)existence of checks and balances between the decision bodies (parliamentary

[1]The Eurobarometer is a survey which is regularly conducted in all European Community members countries. Generally around 1000 respondents are interviewed in each country.

chambers, executive, or the people if a referendum exists) of the legislation. Countries in which these bodies are independent of each other are characterised by an independent central bank. Moreover, in these countries the independence of the central bank is also more effective in reducing inflation than in countries with dependent central banks and weak or no checks and balances. I agree with Moser that support by the political system is important. A disadvantage of his approach is, however, that the checks and balances argument refers to the relation between two bodies of the legislation, whereas central bank independence refers to the relation between one of these bodies (the government) and an specialised institute of the executive branch.

The present paper develops a theory on the impact of culture, in the sense of common values, on inflation and central bank independence. It appears that in theory two cultural variables – Power Distance and Uncertainty Avoidance – have opposite effects on inflation and central bank independence and thus are candidates for explaining the negative correlation between the latter two. Power Distance reflects the extent to which the inhabitants of a country accept that power is distributed unequally within the society. Uncertainty Avoidance refers to the tolerance of uncertainty (ambiguity) which can be found in people. An empirical analysis of 18 OECD-countries is employed to investigate the relationship between these cultural dimensions and inflation and central bank independence.

The set-up of this paper is as follows. The next section presents a framework for analysing the relation between culture, institutions and economic performance. In Section 3 this framework is used for deriving relations between cultural characteristics on the one hand and inflation and central bank independence on the other. The empirical analysis for 18 OECD countries is presented in Section 4. Section 5 contains the conclusions.

2. The relations between culture, institutions and economic performance

Central in this paper is the idea that culture, economic and political institutions, and economic performance of a country are related. By culture I mean the collective programming of mind, which distinguishes the members of one human group (country, society) from another.[2] Culture integrates the society in terms of common goals.[3] A culture is widely shared in a society and is transmitted from generation to generation. Culture is learned and the more central and early-absorbed aspects of culture are resistant to change. Findings of psychologists and physiologists (some references are provided in Denzau and North, 1994) suggest that to a limited extent the structure of a person's mental model is genetic, but for the most part it is developed from the experience, and constant re-evaluation of new experience. Mental models have a layered structure. Deeper layers are more stable than the levels closer to the surface. The experience of early childhood plays a crucial role in structuring these deeper levels. Hence, these layers change gradually through intergenerational population replacement instead of conversion of already socialised adults (Inglehart, 1997, p. 15).

Institutions are "the rules of the game in a society" (North, 1990, p. 3). They structure the incentives in human exchange whether political, social or economic. Institutions can be divided in formal institutions, such as written rules and legislation, and informal institutions: unwritten codes of conduct that underlie, supplement and sometimes even substitute formal rules. In this paper the formal institutions are the laws and regulation of central banks and the informal ones are the practices of monetary policy.

The institutional framework of a society is a function of shared mental models of its members (Denzau and North, 1994). Hence, culture will influence the production

2 Similar definitions can be found in DiMaggio (1994, p.25), Hofstede (1981, p. 21) and Inglehart (1990 and 1997).
3 The following is based on Inglehart (1990 and 1997) and DiMaggio(1994).

process, the form and regulation of exchange and consumption (DiMaggio, 1994). For example, several authors have argued that a market society requires and is succeeded by a certain set of values, such as individualism and achievement. Within the group of countries with a market economy, differences in state-society relations are deeply rooted and the result of national history (see DiMaggio, 1994, p.38). In general, any stable economic system has a compatible and supportive cultural system that legitimates that system (Inglehart, 1997, p. 15)

The laws and codes of conduct in a society form an incentive structure, which determines economic performance (Denzau and North, 1994, p. 27). The Structure-Conduct-Performance Paradigm in industrial economics carries this idea to its extreme (see Swedberg, 1994, p. 262). According to this paradigm the market structure (number of buyers and sellers, type of product) and public policy (taxes, regulation) constrain the decisions of the firm (pricing, product strategy) which in its turn influences the performance of an economy (unemployment, equality in income etc.). Values also directly influence the outcome of the economic process. For example, societies, which stress that in principle all people are equal, attach a higher value to an equal income distribution.

To summarise, I postulate that culture influences economic performance both directly and indirectly - by its impact on formal institutions (laws) and informal institutions (codes of conduct). These institutions can be both economic and political. In Figure 1 the arrows from left to right represent this causal ordering.

(insert Figure 1)

The causality also runs the other way, which is illustrated by the arrows from right to left in Figure 1. The development of an economy will influence both

institutions and culture. For example, the classic bureaucratic institutions of industrial society which were part of the earlier stages of the industrial society are inherently less effective in high technology societies with highly specialised workforces. This explains their decline during recent decades (Inglehart, 1997). The fall of the centralised economies of the formerly communist countries can be ascribed to this increasing inefficiency of hierarchical institutions. A less dramatic example is that due to the low inflation rates in industrialised countries with an independent central bank, the central banks in other countries are also made more independent from political forces. The European Central Bank is without doubt the best example in this respect.

Economic structures and economic performance have an impact on values in a society (see e.g. Bowles, 1998; and Inglehart, 1997). Central in Inglehart's reasoning is that values change in an intergenerational way. He assumes that people place the greatest subjective value on those things that are in short supply; the scarcity hypothesis. The values change gradually because one's basic values reflect the conditions that prevailed during one's pre-adult years. Although it usually changes slowly, culture can change through the interaction with the environment, among which the economic situation in a country is of primary importance. Ingelhart (1997) argues that the high level of income per capita in the industrialized world has brought much certainty to the great majority of the population. This has led to a large shift in values from those associated with the level of living –such as achievement or hierarchy - to greater emphasis on the quality of live.

Figure 1 summarises the relations and feedback mechanisms, which in my opinion are relevant for studying the interaction between culture, institutions and economic performance. the figure shows similarity with Figure 1 in Williamson (2000). Culture corresponds with Williamson's concept of Embeddedness. Figure 1 is very

useful for comparing the present study with the other studies on the mechanism behind the negative relation between inflation and central bank independence, mentioned in the Introduction. Moser (1999) and De Haan and Van ‘t Hag (1995) emphasis the relation between characteristics of the political system (checks and balances, political (in)stability respectively) for the degree of central bank independence and inflation. Posen (1995) and Van Lelyveld (2000) argue that the independence of the central should be supported by an important and effective lobby, in particular the financial system. So these studies can be located on the right-hand side of the figure in that they stress the relation between political and economic institutions, and the latter need support of the political system in order to be effective. Prast (1997) mentions social cohesion, Hayo (1998) refers to the relevance of values and Van Lelyveld (2000) preferences for central bank independence and inflation. So these studies point at the relevance of values. In this respect Hayo (1998) and this paper have much in common in that Hayo also refers to culture and the importance of historical processes for developing a national culture. These studies do not use direct measures of these values, although Hayo and Van Lelyveld derive measures of inflation aversion from survey data. In the present study I use measures of cultural dimensions to approximate the deeply rooted values and relate these to institutions (both political and economic) and inflation.

3. Cultural influence on inflation and central bank independence

In order to find plausible links between culture, central bank independence and inflation, I start on the right-hand side of Figure 1 and first describe the characteristics (effects) of inflation and of the indices of central bank independence. Thereafter, the cultural variables used are explained and related to the features of inflation and central bank independence.

Inflation has many effects, which have been described by several authors (see e.g. Briault, 1995, Driffill et al., 1990; Dowd, 1994). In theory, the various effects of

anticipated inflation are well known and several measures can be taken to minimise their negative effects (see Leigh-Pemperton, 1992, p. 444). Notwithstanding these theoretical findings, Shiller's opinion survey of public attitudes reveals that people do care about various aspects of inflation (Shiller, 1997, p. 57, 58). Many of these aspects are related to the uncertainty resulting from (unexpected) inflation (Bernanke and Mishkin, 1997, p. 106). It is this uncertainty which distorts the economic process in several ways. First, long-term investments are hindered because the time horizon of economic agents is shortened (see, e.g. Tommasi, 1999, p. 403), and a risk premium is demanded which increases the real cost of funds. Secondly, uncertainty about future inflation may increase the attractiveness of real as opposed to nominal assets because the former give a hedge against inflation. As a consequence, inflation hurts those groups most, who are not able to hedge themselves against the risk of rising prices. In general these groups are the poor, so that inflation leads to a more unequal distribution of income in a country (Bulir, 1998; Bulir and Gulde, 1995; and Romer and Romer, 1998). Dollar and Kraay (2000) even conclude that avoidance of inflation in fact is "super-pro-poor". Finally, inflation is likely to distort the relative price signals, especially when inflation is high and variable.[4]

Although the majority of the literature stresses the negative aspects of inflation, at least two positive effects are also distinguished. First, there is the 'oiling the wheels' argument, which reads that a modest level of inflation is necessary for an appropriate functioning of the relative price mechanism. Second, in countries with an inefficient system for collecting taxes, the seigniorage associated with inflation is needed for financing the budget.[5]

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4 Many of the negative effects of inflation could be avoided by the introduction of an indexation scheme. However, the costs of indexation can be high - it can lead to inefficiencies -, and it may undermine the public support for an anti-inflationary policy (see Briault, 1995, p. 37; and Feldstein, 1997, pp. 149-153).

5 Beetsma and Van der Ploeg (1996) argue that the income inequality and the amount of

During the last decade, several indices for approximating the independence of a central bank have been developed. Every index reflects the opinion of the author(s) about the factors that in his view are important for the independence of the central bank. Hence, subjective judgements will influence each index. Mangano (1998) shows that the degree of subjectivity can be relatively high. In particular Forder (1998 and 1999) is very sceptical in this respect. He concludes that since there is no objective reason to prefer one index over the other, "there can be no test of the independence hypothesis" (Forder, 1999, p.29). Others find that the differences between the various indices do not change the main conclusion of this literature, namely that in OECD countries a high level of central bank independence is associated with a low inflation rate (De Haan, 1999, Eijffinger et al., 1998). From this finding they conclude that although Forder has a point, his conclusion is too far fetched (Berger et al., 2000, Section 5.1). I agree with the latter authors and would add to it that implicitly Forder suggests that there is no dispute about the empirical measures of other variables used in economic theory, which certainly is not true. Moreover, I am not primarily interested in the best (if there is any) index of central bank independence (CBI), but in explaining the empirical correlation between the CBI-indices and inflation. Therefore, for this paper I have selected some indices, which are very often used in studies that find a negative impact of central bank independence on inflation.

The indices used are the index developed by Cukierman (1992) and Cukierman et al. (1992)[6], the one of Grilli, Masciandaro and Tabellini (1991), Alesina (1988) and Eijfinger and Schaling (1992). Cukierman and his co-authors distinguish four clusters

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nominal government debt are the determining factors of the seigniorage. Consequently, inequality leads to inflation. For the present analysis the causality between inflation and income inequality is not relevant. Relevant is that at least in OECD-countries inflation and inequality are positively correlated, as is found in Beetsma and Van der Ploeg (1996) and Romer and Romer (1998).

[6]Forder (1998)'s criticism of obvious mistakes and doubtful judgements in constructing the indices of central bank independence does not refer to this index.

of issues of the legal characteristics of a central bank: (a) the central bank's objective, (b) the rules regarding appointment, dismissal, and term of office of the chief executive officer of the bank, (c) policy formation, and (d) the limitations on the ability of the central bank to lend to the public sector. An independent central bank is one for which (a) the charter prescribes price stability as the only or main goal, (b) the legal term of office of the chief executive officer is long and the executive branch has little legal authority in appointing and dismissing the governor, (c) there is a wide authority to formulate monetary policy and to resist the executive branch in case of conflict, and (d) the limits on its lending to the public sector are tight.

Grilli, Masciandari and Tabellini (1991, pp. 366-371) make a distinction between political independence and economic independence of the central bank. Political independence is the capacity to choose the *final goal* of monetary policy, such as inflation or the level of economic activity. Three aspects of the monetary regime are considered to be important: (a) the procedure for appointing the members of the central bank governing bodies; (b) the relationship between these bodies and the government; and (c) the formal responsibilities of the central bank. The political independence of a central bank is greater if (a) the appointments are not under control of the government and are for a long period; (b) prior government approval of monetary policy is not legally required; and (c) the constitution considers preserving monetary stability as a policy goal and provides a transparent procedure for how a conflict between the central bank and the government is to be resolved. Economic independence is the capacity to choose the *instruments* with which to pursue the goals, and reflects (a) the influence of the government in determining how much to borrow from the central bank and (b) the nature of the monetary instruments under control of the central bank. A central bank is more independent if direct credit to the government is non-automatic, at market interest rates, temporary and in a limited amount. The nature of monetary instruments refers the

control of the discount rate and banking supervision. An independent central bank controls the discount rate and has no responsibility for bank supervision.

The index by Alesina (1988) and that by Eijffinger and Schaling (1992) measure in different ways the political independence as discussed above with respect to the GMT-index; the ability of the central bank to select its policy objectives without influence of the government. The index by Alesina is based on the work by Bade and Parkin. Alesina extends four countries to the twelve countries considered by Bade and Parkin. Differences between ES and AI are caused by different interpretations of some national laws and practice and by a different weighing of the criteria. As GMT, Alesina derives his index by summing the individual scores on the different aspects. Hence each item has an equal weight in the index. As Cukierman c.s., Eiffinger and Schaling try to approximate the relative importance of each item by assigning different weights to the items. A summary of this interpretation effect and criterion effect are listed in Eijffinger and Schaling (1993), Table 5.

Summarising this brief overview of indices of central bank independence, I conclude that the index by Cukierman c.s. and that by Grilli, Masciandaro and Tabellini are relatively broad and contain two main dimensions namely: price stability and independence. The indices by Alesina and by Eijffinger and Schaling measure independence only. The motives for including price stability in the central bank's charter are the same as those for striving for price stability. The other characteristics refer to the legal ability of the government to influence the policy of the central bank. Note that all indices stress the relation between the central bank and the government and do not pay attention to the relation between the government and the parliament.[7] The task is then

7 The legislative branch is only referred to when measuring the resolution of conflicts. This index is one of the 16 indices used for deriving the index of central bank independence. See Cukierman (1992), Table 19.1.

to discover the variable(s) that can explain the differences between countries in degree of dependence of institutions on the executive branch.

The cultural variables used, are those, which Hofstede (1980) derived from a survey on work-related values among employees of IBM in 40 countries. The survey was conducted from 1968 to 1973. Researchers from different Western countries formulated the questions of the survey in order to avoid a national bias. Factor analysis has been applied to this data set of over 116,000 questionnaires to determine the values that explain the differences between national cultures. Four factors are found: Power Distance, Individualism, Masculinity and Uncertainty Avoidance. The countries used in the present study all score high on the individualism index, so that it is implausible that individualism will contribute to an explanation of the differences in institutions and economic performance in these countries.[8] I therefore only describe the three remaining factors.

Power Distance (PDI) refers to the extent to which the society accepts that power, within its organisations and the society as a whole, is distributed unequally.[9] In societies with large Power Distance people perceive that here should be an order of inequality in which everybody has a rightful place, and such an order provides the best protection for everyone. In societies with a low score on Power Distance an inequality of roles is established only for convenience. The score on PDI is positively correlated with (a) an unequal distribution of income (Hofstede, 1980, p.98), (b) political violence (ibid, p.103), (c) a centralisation of political power and political strength (ibid, pp. 97 and 98), and (d) the Aston dimension of "concentration of authority" (ibid, p. 106). For example, in European countries that score high on PDI the expenditures and employment by local governments is much lower than in countries with a low score on

8 Moreover, in a previous version of this paper, I argue that it is not plausible that individualism has any relation with the issue at hand.

9 Power Distance refers to a characteristic of social systems and not of individuals (Hofstede,

PDI. Moreover, in the former countries localities have fewer functions and more detailed control exerted on them (Page and Goldsmith, 1987). An unequal income distribution is associated with a high inflation rate (see among others Dollar and Kraay, 2000 and Beetsma and Van der Ploeg, 1996), and a high score on PDI reflects more acceptance of inequality. I, therefore, expect a positive relation between PDI and inflation. The tendency in high PDI countries to centralise political power suggests that in these countries central banks will be dependent; PDI and central bank independence are negatively correlated.

The second factor of national culture is Uncertainty Avoidance (UA). "The main underlying dimension is the tolerance for uncertainty (ambiguity) which can be found in individuals and which leads some individuals in the same situation to perceive a greater need for action for overcoming the uncertainty than others" (Hofstede, 1980, p. 118). People in societies with a high score on Uncertainty Avoidance perceive uncertainty as a continuous threat that must be fought. In these countries people take less risk and are to a larger extent dependent on authorities. In these societies one tries to reduce the uncertainty by means of legislation, formal rules and specialisation (see Hofstede, 1980, pp. 135 and 142). Inhabitants of countries with a low score on UA accept uncertainty inherent in life much more easily. They take more risk and tend to have a stronger feeling of citizens' competence versus authorities, whose reason of existence is perceived as service to citizens. Since a major effect of unanticipated inflation is an increase in uncertainty, I expect a negative relationship between Uncertainty Avoidance and inflation.[10] Because the objective of monetary policy forms part of the Cukierman-index and the index by Grilli, Masciandaro and Tabellini, for these indices Uncertainty Avoidance might also have a positive effect on central bank

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1980, p. 76).

10 Note that this is a cross-country analysis, where each observation is the average of a variable during at least one decade. Hence, short-term relations as the Phillips-curve are not

independence. Moreover, countries with a high score on Uncertainty Avoidance are characterised by specialisation and formal rules, which corresponds with an independent central bank. Hence, there might also be a positive relation between Uncertainty Avoidance and the two other indices, although this effect is expected to be of less importance.

The last factor is Masculinity-Femininity (MAS). It measures to what extent respondents in a country (of both sexes) tend to endorse goals usually more popular among men (high MAS) or among women (low MAS). Important goals for people in a masculine society are advancement, earnings, and freedom. In countries with a high score on the masculinity index, achievement is defined in terms of status and wealth, salary is preferred to shorter working hours, men and women follow different types of higher education and economic growth is regarded as important (Hofstede, 1980, Figure 6.3 and Figure 6.6). Feminine societies stress equality and solidarity; managers strive for consensus. Hofstede, however, does not report a relation between inequality in income and the masculinity index. Because of the emphasis in feminine countries on equality, it might be that there is a positive relation between masculinity and inflation. Although, I expect that Power Distance will dominate Masculinity in these regressions. In his list of connotations of Masculinity, Hofstede only indirectly refers to factors that can be related to the effects on the degree of central bank independence. Moreover, in his study of industrial relations, Semenov (2000, Section 6.5) finds that centralised bargaining took place in relative feminine countries, which suggests that in feminine countries there is more collusion of power. This would imply that feminine countries have dependent central banks and low inflation, which is opposite to the empirical evidence found in many studies. I, therefore, do not expect a relation between

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relevant.

Masculinity and central bank independence. Nevertheless, in the empirical part I will check whether this assertion is correct.

From the discussion presented above I derive the following hypotheses:

Hypothesis 1: Inflation is high in countries that score high on Power Distance and low on Uncertainty Avoidance.

Hypothesis 2: Central banks are relative more dependent in countries, which have a high score on Power Distance and a low score on Uncertainty Avoidance.

Hypothesis 3: There is at best a weak positive relation between Masculinity and inflation.

Hypothesis 4: There is no relation between Masculinity and central bank independence

As these hypotheses show, Power Distance and Uncertainty Avoidance both have an opposite effect on inflation and the degree of central bank independence. So, in principle they could explain the negative relation between inflation and central bank independence.

4. Empirical results

4.1 Some methodological issues

Before proceeding to the data and empirical results, I discuss two methodological issues, namely the causality and the way I deal with outliers.

As Figure 1 illustrates, values, institutions and economic performance interact with each other so that in principle the direction of the causality is difficult to be determined. Nevertheless, I think that in this study it is more likely that causality runs from culture through institutions to economic performance than the other way round. In general, causality has at least three features: there must be a statistical association between two variables, the independent variable (the 'cause') must temporally precede the dependent variable (the 'effect'), and the association between the two variables may not be the result of a 'third' variable. The statistical association is revealed by means of the t-statistic and the F-statistic.

As is common usage in social research, the validity of causal relations is evaluated at the basis of relative fixity or alterability of the variables: the suggested cause – values - should be less alterable than the suggested effect – institutions and economic performance (e.g. Punch, 1998). As is argued in Section 2, there are many theoretical and empirical arguments in favour of the hypothesis that values change more slowly than central bank laws and inflation, certainly during such a short period as is considered here. This argument is reinforced by Williamson (2000) who argues that culture (which he labels Embeddedness) changes very slowly – on the order of centuries or millennia. Moreover, the cultural values are derived from questionnaires that were held in the years 1968 to 1973, whereas the observations of the other variables start in 1972.

The third criterion – that there is no 'third' variable - is met if the cultural variables are constant during long periods of time and they represent deeply rooted values in the societies. In order to investigate whether the factors found are deeply rooted in the tradition of the societies, Hofstede relates the dimensions of culture to various factors and to results found by other researchers. He finds that Power Distance and Masculinity are highly correlated with geographical latitude - which is a proxy for climate - and to a lesser extent with the size of a country. Uncertainty Avoidance appears to be associated with the date of establishing a democratic regime; young democracies

tend to show higher scores on UA. They acquired their present form of government after a war in which they played a more or less aggressive role (Hofstede, 1980, 133). Moreover, high scores on Uncertainty Avoidance coincide with occupation during the Roman Empire. Hence, Hofstede's cultural dimensions are likely to be deeply rooted in the societies. A conclusion which is reaffirmed by many other studies on work-related values (see Chinese Cultural Connection, 1987; Smith et al. 1994; and Smith et al. 1996).

Outliers frequently occur in cross-section analysis of various countries. As is well known, outliers lead to heteroskedastic disturbances and thus to inefficient estimates of the coefficients and biased estimates of the corresponding variances (Judge et al., 1980, p. 127). Some studies drop these observations (see, e.g. Temple, 1998; Romer and Romer, 1998; and Beetsma and Van der Ploeg, 1996). I agree with Sturm and De Haan (2000) that the use of a robust regressions method is to be preferred. The estimators of such a technique are not strongly affected by outliers (also known as influential observations). I use the method proposed in Welsch (1980). This procedure consists of two steps. First, it investigates whether there are any influential observations. An observation is influential if it has a combination of values of dependent variables substantially different from the rest *and* it has a large influence on the fit of the regression. If there are no influential observations then the equation is estimated by Ordinary Least Squares. In case influential observations are found, Weighted Least Squares is applied, where the influential observations have a weight less than one. The Jarque-Bera test is used for investigating the normality of the disturbances. The Obs*r-squared statistic of White (without cross terms) is used for testing the homoskedasticity of the error terms.

4.2 The data

The previous sections have concentrated on the possible links between the three dimensions of culture and the institutional design of a country. The negative relation between the level of inflation and central bank independence has been found for industrial countries.[11] The empirical part of this study is therefore restricted to 18 industrialised countries for which observations for almost all variables are available.[12] The equations are estimated for the period 1972-1989. The cultural variables are from Hofstede (1980). The inflation rates are the changes in consumer price indices as published in the IMF, International Financial Statistics (line 65). The indices of central bank independence are from Cukierman et al. (1992), Grilli, Masciandaro and Tabellini (1991), Alesina (1988) and Eijfinger and Schaling (1992). Table 1 shows the data on the cultural dimensions, inflation and central bank independence for the 18 countries considered. As the table illustrates for a few countries there are no data available of some indices of central bank independence. For example three Scandinavian countries are not considered in the calculation of the index by Grilli c.s.. In these cases the analysis is restricted to the countries for which data are available.

(insert Table 1)

[11] See, Cukierman et al.(1992) and Campillo and Miron (1997). For developing countries the relation found is between inflation and the turn-over of the Chief Executive Officer of the central bank (Cukierman et al., 1992, p. 373).

[12] These countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, The Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States. Iceland is not in our sample because the cultural variables are not available. Temple (1998) shows that Iceland is an outlier, which has a large effect on the results. Hence, although it is by accident, the sample reduces the problems associated with heteroskedasticity.

4.3 Cultural influences on inflation

When regressing inflation on the three cultural variables and a constant term, the coefficients of Power Distance and Uncertainty Avoidance have the correct sign but are insignificantly different from zero (upper part of Table 2, column 1). Uncertainty Avoidance shows the highest absolute value of the t-statistic, which suggests that Uncertainty Avoidance is the most important cultural variable.

(insert Table 2)

This basic equation gives a first impression only. It might be that the estimated parameters are biased due to missing variables. In case this is a downward bias of the absolute value of the coefficient the bias might also reduce the t-statistic.[13] A procedure to avoid this missing-variables bias, would be to include in the regression as many as possible explanatory variables and subsequently delete the most insignificant ones. However due to the limited number of observations and consequently, the limited degrees of freedom, such a procedure is impossible. I therefore, subsequently add one variable to the basic relation. In this way the robustness of the effects is tested too. Variables added to the relation are those suggested in other studies on cross-country analyses of inflation (in particular, Heylen and Van Poek, 1996; Romer, 1993; Moser, 1999; and Campillo and Miron, 1997). Variables which will be considered are:[14] the

13 Missing variables lead to a biased estimate and smaller variance of the estimated coefficient. Since the t-statistic is the ratio of the mean and standard deviation of the estimated coefficient, a relatively large downward bias (in absolute value) might more than compensate the smaller variance. See, Judge et al. (1980), p. 408.

14 Campillo and Miron (1997) also include into their analysis a variable labeled “quality of the data”. This variable has the same value for all countries, except for Switzerland. Hence, including quality of the data in the list of regressors would amount to a country-dummy for Switzerland. I therefore have not considered this variable. The sources of the other variables

degree of central bank independence (-), average inflation rate from the pre-sample period as a measure of the taste for inflation(+), log of income per capita (-), political instability measured by the number changes of the government (+) and by the number of significant government changes (+), the political colour of the government (Left, +), government debt as a percentage of GDP (+), the exchange rate system (+), openness (-), and the extent to which the legislative function is shared by different bodies. The signs between brackets indicate the theoretically expected signs of the coefficients. The extent to which the legislative function is shared by different bodies is from Moser (1999) and is represented by three dummy variables: strong, weak and no checks and balances. The sum of these three variables equals one so that the intercept (or one of these variables) has to be deleted from the regression in order to avoid singularity of the regression matrix. It is expected that more checks and balances are correlated with lower inflation rates. The variables on checks and balances in the legislative system and that on central bank independence are institutional constraints and thus makes part of the box "Institutions" in Figure 1, the other variables belong to the box "Performance". Inflation is also a performance variable. The cultural dimensions, however, belong to the box "Culture" and change much more slowly than the institutional and performance variables (see Section 4.1 and Williamson, 2000). Hence, I expect that in the regression analysis

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are the following. The number of policy changes and the number of significant government changes in the period 1980 to 1989 are from De Haan and Van 't Hag (1995), who derived them from Keesing's Histrocial Archives and Bank's Handbook of the World, respectively. The variable on checks and balances in the legislative function is from Moser (1999). Left is the variable representing the political colour of a government and is also from Table 6.A.2 in Alesina et al. (1997). This variable classifies governments either as left- or right-wing. The time series of annual data is one for a left-wing government and zero for a right-wing one. The variable Left used in the regressions is the weighted average over the sample period, where the weights are equal to the number of years (as a percentage of the total) a left (right) wing government has been in office during the period concerned. Exchange rate system: this variable ranges from 0 for fixed exchange rates to 2 for fully flexible exchange rates. The classification is from the IMF, Annual Report on Exchange Arrangements and Exchange Restrictions. The variable is the average for the period 1972 to 1989. Openness is measured by

the performance variables are more significant than the institutional variables which in their turn are likely to be more significant than the cultural dimensions. Consequently, even if the cultural variables would appear to be less significant than the other variables, in my opinion this would not necessarily imply that they do not play any role.

Given the central place of central bank independence in this study the influence of central bank independence on inflation is considered separately, see Tables 3 and 4. The regressions with the cultural dimensions and one additional factor (other then central bank independence) as explanatory variables are presented in Table 2. All regressions contained influential observations, so that weighted least squares is used. As columns 2 through 10 of Table 2 show, Uncertainty Avoidance has a significant coefficient in five out of ten cases, and Power Distance and Masculinity each three out of ten regressions.[15] This confirms our impression that for inflation Uncertainty Avoidance is the most important cultural dimension.[16] The relevance of Power Distance for inflation is lower than I expected (see Hypothesis 1) and that of Masculinity is higher than I had thought at forehand (Hypothesis 3). Combining these results, I conclude that based on statistical significance for inflation Uncertainty Avoidance is the primary cultural factor and that a tolerance for inequality and centralisation of authority - measured by Power Distance or Masculinity - is of secondary importance.

In order to obtain an idea of the robustness of the results, regressions have been run in which two variables were added to the basic relation.[17] The range of the P-values

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the average share of imports in GDP.

15 Note that in almost all cases where the coefficient is statistically significant, the absolute value of the parameter is much larger than in the basic relation. This illustrates the importance of biased estimates due to missing variables (see note 14). Sometimes the differences in absolute value are not that large or the absolute value of the significant coefficient is even smaller than in the basic relation (see Uncertainty Avoidance in column (a)). This is due to the fact that weighted least squares is employed, with different weights for each regression.

16 Romer (1993) also finds that the coefficient of openness is very insignificant.

17 In this respect the variables on the checks and balances within the legislative function are

of the cultural variables is listed in Table 2, Part B. These P-values reaffirm the conclusion that based on statistical significance Uncertainty Avoidance is the most robust cultural factor explaining cross-country differences in inflation between OECD-countries; many P-values are in the range of 1% to 5% and the maximum P-value is 16%.

(insert table 3)

Before presenting the results of the results of the multiple regressions of central bank independence along with cultural variables on inflation, Table 3 gives partial correlations between the different (sub)indices of central bank independence and inflation. Let us first concentrate on the four main indices. Then it appears that the correlation between the Cukierman-index and the GMT-index is relatively high (0.79), whereas the first has a correlation of 0.62 with Alesina-index and 0.55 with the E&S index. The index by Eijffinger and Schaling is quite different from the others: the correlation coefficient ranges from 0.69 (with the index of Alesina) to 0.38 with the index of Grilli c.s.. The low correlation with the GMT-index can partly be ascribed to the fact that the common set of these two indices consists of fourteen countries only. The relatively low correlation between E&S-index and the indices of Cukierman and that of Alesina is not due to large differences in countries concerned; the sets differ with respect to one country only. The aim of this paper is to explain the negative correlation between central bank independence (CBI) and inflation found in many empirical studies (see e.g. Eijffinger and De Haan, 1996, Section 4.1 and Berger et al., 2000). Hence, it is crucial that in the present sample this correlation is negative and significant. Except for the Cukierman-index on appointment, the correlation between an index and inflation

considered as one variable.

is negative (Table 3, last column). For most indices the t-statistic of the coefficient of central bank independence is statistically significant in the regression of inflation on central bank independence and an intercept (last row of Table 3). Exceptions are Cukierman's sub-indices on appointment and conservative and the GMT-index on political independence. Hence for the majority of indices there is a negative relation between central bank independence and inflation.

(insert Table 4)

As in De Haan and Kooi (1997, Table 2) the indices of appointment, financial and conservative do not have a significant impact on inflation (Table 4). The coefficients of the other indices are statistically significant, and thus confirm the widely held result that an independent central bank is associated with low rates of inflation. The regressions where central bank independence is represented by the total index of Cukierman and GMT confirm the results from Table 2 that Uncertainty Avoidance and tolerance of differences within society - measured by Masculinity or Power Distance – are the important cultural dimensions. Once again the relevance of Power Distance is less and that of Masculinity more than I had expected at forehand. Uncertainty Avoidance is also statistically significant for the GMT-indices on political and economic independence. For the latter Masculinity and Power Distance are statistically significant too. In the regressions with the sub-indices of Cukierman's index, Masculinity is statistically significant in two out of five cases and the coefficients of the other cultural variables are never significant. No cultural variables are statistically significant in the regression with the index of Alesina or that Eijffinger and Schaling.

4.4 Cultural values and central bank independence

No influential observations were found in the regressions for central bank independence when measured by Cukierman's index. Power distance appears to be the most important cultural factor in explaining the degree of independence of the central bank (Part A of Table 5, column 1). Although, maybe due to the missing variables bias, its coefficient is still insignificant in the OLS regression. In order to investigate the consequences of missing variables and the robustness of this result, I have subsequently added to this basic relation one of the explanatory variables included in De Haan and Van't Hag (1995) and Moser (1999).[18] De Haan and Van't Hag argue that a central bank will be more independent the higher the motivation for increasing inflation due to a high equilibrium unemployment rate or a high debt/GDP ratio. Political instability will lead to a dependent central bank. Political instability is proxied by the frequency of government changes during the 1980s (Change) and the frequency of significant government changes, i.e., when another party (or coalition) comes into power (Significant).[19] I have added the exchange rate system to their list of variables. The reason is that often both fixed exchange rates and an independent central bank are mentioned as devices by which monetary policy can be shielded from political influences. Hence in an anti-inflationary policy they can serve as substitutes for each

18 I have not included the variables put forward by Hayo (1998), Posen (1995) and Van Lelyveld (2000). The reason is that these studies consider a smaller number of countries than I do. Hence, comparing the results of regressions with these variables with those of the other regressions would introduce a selection bias.

19 De Haan and Van't Hag also mention that high inflation in a previous period can increase the preferences for low inflation rates and thus for an independent central bank. They do not report these prices for all countries concerned. Therefore, I have not added the inflation of the period before the Second World War in the regressions. The sources of the variables not derived from IMF publications and not listed in note 14 are the following. Equilibrium unemployment rate for the 1970s and 1980s: Layard, Nickel and Jackman (1991, p. 436). Average inflation from 1900-1940: Maddison (1991).

other.[20] Finally, the variables on checks and balances between the decision bodies of the legislative function are considered. Countries with stronger checks and balances are expected to have a more independent central bank.

(insert Table 5)

As columns 2 trough 7 of Part A of Table 5 show, Power Distance is the most important cultural dimension for explaining the degree of central bank independence, although its coefficient is only significant in two out of six regressions.

The coefficients of Uncertainty Avoidance and Masculinity are always insignificant. Therefore, Part B of Table 5 reports the results for the regressions with Power Distance as the only cultural dimension. Then Power Distance has a significant impact in five out if seven cases. In both sets of regressions the exchange rate regime and the variables on checks and balances are the only additional variables that have a significant impact on central bank independence. Moreover, as expected the magnitude of the coefficient of the checks and balances dummies show that the central bank is more independent in countries where the legislative function is shared by different bodies. The fact that both Power Distance and checks and balances are statistically significant in both regressions, suggests that the relation between the different legislative bodies and that between the government and the executive institutions is relevant. In countries where the legislative bodies share responsibilities, the government delegates authority to independent institutes. Of course, this finding is perfectly in line with the idea of

20 One can argue that the size of the country is also relevant: for a large country it is mostly politically less opportune to peg its currency to that of a small one (see Mishkin, 1999, p. 12). Hence, size might also be an explanatory variable. I did not include size in the list of explanatory variables because size is correlated with Power Distance (see Hofstede, 1980, 95-98).

embeddedness, which can be regarded as claiming that the character of the institutions in one area should correspond with that in another field of the society.

In order to investigate the robustness of the finding that based on statistical significance Power Distance is the dominant cultural factor, regressions are run in which two variables are added to the basic equation. The P-values of the coefficients of Power Distance and Uncertainty Avoidance are presented in Part C of Table 2. They confirm that the level of central bank independence is correlated with by Power Distance; almost half of the P-values is smaller than 1% and the maximum value is 14%. Uncertainty Avoidance doesn't play any role. Hence Hypothesis 2 is confirmed with regard to power Distance and rejected for the expected impact of Uncertainty Avoidance. If Masculinity is included (regressions not shown), its coefficients is often insignificant and has the wrong sign. This affirms my prior that Masculinity is not relevant (Hypothesis 4 in Section 3).

In order to shed more light on the source of these results, Tables 6 –10 present the regressions in which one or more sub-indices are the independent variables. The results are very

(insert Tables 6 – 10)

diverse with regard to the cultural variables. Power Distance, Uncertainty Avoidance and Masculinity all are significant in some regressions. It is very remarkable that, except for the intercept, Masculinity is the only variable, which sometimes has a significant impact on the appointment-index (Table 6). Moreover, its coefficient is positive, indicating that a high score on Masculinity is correlated with long legal terms of office and limited legal authority for the executive branch to dismiss the governor. It should be noted however that the R^2(adjusted) is very low for all regressions of the appointment-index. The instrument-variable – measuring the independence of the central bank with respect to

policy-making - is significantly associated with Power Distance and Uncertainty Avoidance (Table 7 part A). One of the checks and balances variables is the only variable that also has a significant coefficient. Since the coefficient of Masculinity is never significant in any regression, I have also run regressions without this variable (Table 7, part B). Then Uncertainty Avoidance is always significant and Power Distance is significant in three out of seven regressions. The debt to GDP ratio also appears to have a significant impact. So in both regressions the cultural dimensions Power Distance and Uncertainty Avoidance are the most important explanatory variables. This result underscores the idea that inhabitants of countries with a high level of Uncertainty Avoidance prefer independent specialised institutions, and (to a lesser extent) that low Power Distance is associated with sharing of authority. The index of financial independence is determined by variables representing the political system – (significant) changes of government and checks and balances – and in the specification with the checks and balances variable also by Power Distance (Table 8). It appears that conservative (the legal objective of the central bank) cannot be explained by the set of variables considered (Table 9). All R-squared are low and there is only one specification in which the coefficients of two variables are significant: Power Distance and the equilibrium level of unemployment. One can argue that the index on conservativeness reflects the legal goal of the central bank and that the three other indices (appointment, instrument and financial) reflect the independence. It therefore makes sense to investigate the determinants of the index consisting of the sum of the latter three. The overall fit of this relation is much better than that of the individual indices. Significant variables appear to be Masculinity, Power Distance, the exchange rate mechanism, and variables reflecting the political system: changes of government and checks and balances (see Table 10). The coefficient of Masculinity is positive, whereas I expected no significant influence (Hypothesis 4). As discussed above, this is due to the positive relation between Masculinity and the index on appointment (Table 6).

(insert Tables 11-13)

The cultural dimensions hardly have any effect on the GMT-index of central bank independence (Table 11) and the two sub-indices on political (Table 12) and economic (Table 13) independence. Out of 24 regressions, the coefficient of Power Distance is significant in only one case, that of Masculinity in two cases and that of Uncertainty Avoidance in three cases of which two are wrongly signed. The variables reflecting the political situation – (significant) change of government, and checks and balances between the legislative bodies – fare better in explaining the independence of the central bank. It might be that this large difference in results between using Cukierman's index and the GMT-index results from the differences in countries covered by each index. I therefore have re-estimated the relations with the Cukierman- index for the countries used in the regressions with the GMT-index. It appears (results not shown) that Power Distance and to a lesser extent Uncertainty Avoidance are even more significant in these regressions than in those shown in Table 5, Part A. Hence, the difference in results have to be ascribed to the different ways the two indices of central bank independence are constructed.

(insert Tables 14)

Each cultural variable has one significant coefficient in case Alesina's index of central bank independence is used (Table 14). Masculinity once again has a positive coefficient. Of the other variables only debt/GDP and the dummy for countries with no checks and balances have a significant coefficient. In general, it appears to be difficult to explain the Alesina-index by means of the set of variables considered.

(insert Table 15)

For the index of Eijfinger and Schaling, the best results are obtained when the cultural dimensions are supplemented by the variable measuring significant changes of the government (Table 15). In that case all variables have a significant impact, the cultural dimensions are correctly signed, whereas the variable on government changes is not. The regression with the exchange rate system is also relatively good. The other regressions results are poor. It is remarkable that the regression with the dummies on checks and balances between the legislative bodies is very poor indeed, whereas for the other indices this specification mostly shows the best results. For six countries the Eijfinger and Schaling index is based on relatively new central bank laws (see Eijfinger and De Haan (1996, Table 2, note b). This might partly explain the differences in results between this index and the others. Austria is one of these six countries and appeared to be a very influential observation.

(insert Table 16)

In order to derive an overall conclusion, I have listed in Table 16 for each explanatory variable, the number of cases that the corresponding coefficient appeared to be significant and whether the sign of this significant coefficient was in accordance with the sign expected from theory. Within the group of cultural dimensions, both Power Distance and Uncertainty Avoidance have 16 rightly signed significant coefficients. Power Distance does not show any significant coefficient with a wrong sign. Uncertainty Avoidance has two wrongly signed significant effects. Moreover, the significant coefficients for Uncertainty Avoidance are concentrated in the regressions with instrument independence of Cukierman as the dependent variable (11of the 16 significant coefficients). If significant, Power Distance always has the right sign.

Furthermore, for every group of indices Power Distance and Uncertainty Avoidance appear to have a significant effect in at least one regression. By far the majority of the significant coefficients of Masculinity have a positive sign, whereas I expected no relation (see Hypothesis 4). From these results I conclude that Power Distance and Uncertainty Avoidance are the most relevant cultural dimensions for explaining central bank independence. These factors represent the attitude towards concentration of authority and the desire to use specialised institutions, respectively.

Of the set of conditioning variables, only the variables on checks and balances between the legislative bodies frequently influence the central bank independence significantly. For the (sub)-indices of the Cukierman-index, Power Distance is often also significant in the regressions with the checks and balances variables.

5. Conclusions

By now there is a large amount of empirical evidence of a negative correlation between central bank independence and inflation. In general this correlation is interpreted as causation from central bank independence to inflation. Recently, however, many authors question this causation running from central bank independence to inflation. Critics argue that there could be a third factor explaining the negative relation between central bank independence and inflation. In this paper I investigate the suggestion that culture in the sense of common values is this third factor. In this respect the cultural dimensions of Hofstede are used. I argue that Power Distance and Uncertainty Avoidance are the cultural dimensions that could serve as this third factor. Countries which score high on power distance are also characterized by an unequal distribution of income (which can be a result of inflation), and a centralization of political power. The latter results in institutions which highly dependent on the central government. Power Distance, therefore, is expected to be positively correlated with inflation and negatively with central bank independence. Inflation leads to uncertainty, so that we expect inflation to

be low in countries in which the inhabitants see uncertainty as a thread. Another characteristic of countries that score high on Uncertainty Avoidance is a preference for specialized institutions, which are independent from the government. As a result, Uncertainty Avoidance is expected to be negatively correlated with inflation and positively with central bank independence.

These hypotheses are tested for eighteen OECD-countries for which data are available. In these countries cross-country differences in inflation appear to be related to the attitude of people with regard to uncertainty; inflation is lower in countries where people dislike uncertainty. The tolerance of inequality in the society (reflected in the Power Distance or Masculinity) appears to be of less importance. The degree of independence of the central bank is correlated with Power Distance and Uncertainty Avoidance. The good results of the latter are almost entirely resulting from the regressions with the instrument independence of Cukierman as the dependent variable. For every index of central bank independence considered, Power Distance has at least one regression with a significant and rightly signed coefficient. Moreover, in no regression Power Distance shows a significant and wrongly signed coefficient. From this I conclude that although bot Uncertainty Avoidance and Power Distance are important cultural variables correlated with central bank independence, Power Distance is the most important one. Thus, the extent to which one is willing to share authority in the society is slightly more important than the preference for specialized institutions. In accordance with the sharing-authority-argument, the extent to which the legislative bodies share equally the legislative function appears to be important too. The exchange rate mechanism is the only other factor relevant for central bank independence; central banks are more independent in countries with flexible exchange rates.

These results confirm the hypothesis that cultural dimensions matter. However, at first sight there is not one single dimension that dominates in the sense that it is the most important cultural factor correlated with both inflation and central bank

independence. Both Uncertainty Avoidance and Power Distance appear to be relevant. A closer look reveals, however, that the tolerance of inequality with respect to income, wealth and authority is in all likelihood the best candidate for the common third factor behind inflation and central bank independence. Although, Uncertainty Avoidance is the most important cultural dimension related with inflation, a measure correlated with the acceptance of differences in authority and inequality – Power Distance, Masculinity - is often also significant. Power Distance is significantly correlated with central bank independence. Hence, I conclude that in all likelihood the acceptance of differences in authority and inequality – mostly represented by Power Distance and sometimes by Masculinity - is the best candidate for being the factor correlated with inflation and central bank independence. Of less importance but still relevant is that countries with a low acceptance of uncertainty are associated with low levels of inflation and specialized institutions, such as independent central banks.

Acknowledgment
This is a thoroughly revised version of the papers 'Disinflation, Central Bank Autonomy and Cultural Values' and 'Is the ECB too Independent? An investigation of the negative correlation between price stability and statutory independence of central banks'. I am grateful to members of the Department of Applied Economics (in particular Harry Garretsen, Iman van Lelyveld and Radislav Semenov), participants in a seminar at the University of Groningen, and two anonymous referees for comments. Furthermore, I thank Peter Moser, Marta Campillo and Jeffrey A. Miron for sending me the data used in their research. Finally, efficient research assistance by Sipke Overbeeke is gratefully acknowledged. The usual disclaimer applies.

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Figure 1The relation between culture, institutions and economic performance

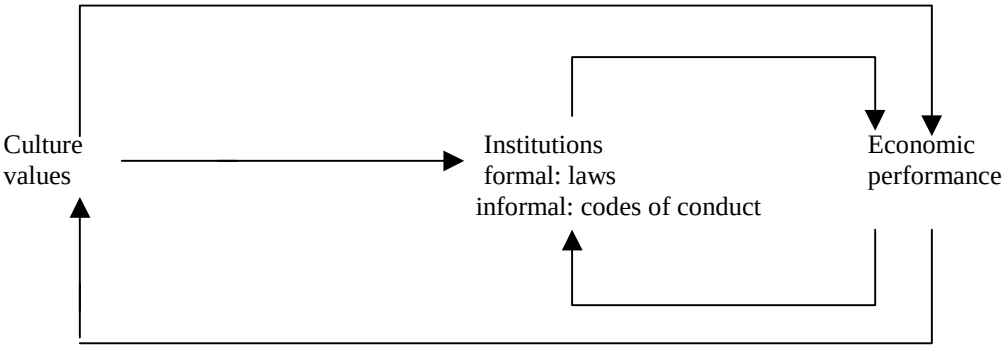

Table 1 The Data on Cultural Dimensions, Inflation and Central Bank Independence

	Cultural Dimensions			Inflation	Central bank independence			
Country	PDI	MAS	UAI		Cuk	GMT	AI	ES
Australia	36	61	51	9.58	0.36	9	1	1
Austria	11	79	70	5.02	0.61	9		3
Belgium	65	54	94	6.22	0.17	7	2	3
Canada	39	52	48	7.37	0.45	11	2	1
Denmark	18	16	23	8.31	0.50	8	2	4
Finland	33	26	59	9.34	0.28		2	3
France	68	43	86	8.42	0.24	7	2	2
Germany	35	66	65	3.85	0.69	13	4	5
Ireland	28	68	35	11.32	0.44	7		
Italy	50	70	75	12.54	0.25	5	1.5	2
Japan	54	95	92	5.68	0.18	6	3	3
Netherlands	38	14	53	4.90	0.42	10	2	4
New Zealand	31	8	50	8.35	0.24	3	1	3
Norway	22	58	49	12.02	0.17		2	2
Sweden	31	5.0	29	8.37	0.29		2	2
Switzerland	34	70	58	4.02	0.59	12	4	5
U.K.	35	66	35	10.28	0.27	6	2	2
U.S.	40	62	46	6.47	0.48	12	3	3
Mean								
St. Deviation								
No. Observations					18	15	16	17

Legenda

PDI	Power Distance Index
MAS	Masculinity
UAI	Uncertainty Avoidance Index
Cuk	Index of central bank independence calculated by Cukierman
GMT	Index of central bank independence derived by Grilli, Masciandaro and Tabellini
AI	Index of central bank independence calculated by Alesina
ES	Index of central bank independence derived by Eijffinger and Schaling

Table 2 Cultural Determinants of Cross-country Differences in Inflation
basic relation and sensitivity analysis

A Regressions with cultural variables and one additional variable

		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Constant	9.304	0.701	88.17	8.24	4.27	9.33	8.47	10.52	10.63	
term	(5.550)	(0.29)	(3.54)	(6.27)	(1.87)	(4.88)	(4.61)	(7.94)	(3.08)	
Power	0.078	0.046	0.117	0.011	0.127	-0.016	-0.027	0.206	0.086	0.086
Distance	(1.00)	(0.84)	(2.01)	(0.18)	(2.33)	(0.40)	(0.33)	(3.51)	(1.04)	(1.40)
Uncertainty	-.085	-.056	-.104	-.081	-.113	-.129	-.018	-.174	-.086	-.137
Avoidance	(1.69)	(1.60)	(2.88)	(1.66)	(2.74)	(3.98)	(0.32)	(4.04)	(1.76)	(3.32)
Masculinity	.001	.046	.004	.027	.043	.019	-.015	.085	.005	.055
	(0.04)	(2.74)	(0.22)	(0.93)	(1.76)	(0.83)	(0.51)	(2.96)	(0.21)	(2.65)
Additional		1.77	-20.12	1.52	6.90	1.13	0.081	-4.11	-.024	6.62
variable		(4.18)	(3.18)	(2.88)	(3.15)	(3.06)	(2.53)	(4.37)	(0.64)	(3.76)
Weak checks										9.55
and balances										(7.40)
No checks										11.96
and balances										(5.97)
R^2(adjusted)	0.058	0.49	0.45	0.35	0.37	0.50	0.45	0.56	0.04	0.64
F-statistic	1.349	5.016	4.52	3.25	3.45	5.26	4.53	6.31	1.15	7.14
P-value	0.30	0.01	0.02	0.05	0.04	0.01	0.02	0.01	0.38	0.00

Variable added: (a) Average inflation 1948-72; (b) Log income per capita in 1980; (c) Coups and revolutions; (d) Significant change of government; (e) Left; (f) Debt/GDP (%) 1975; (g) Exchange rate system; (h) Openness; (j)Checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute value of t-statistics.

Table 2 (continued)

B Regressions with constant term, power distance, uncertainty avoidance and two additional variables

P-values of cultural variables (number of cases)

	P<1%	1%<P<5%	5%<P<10%	P>10%
Power Distance	5	7	5	28
Uncertainty Avoidance	25	10	5	5
Masculinity	10	12	9	16

Table 3 The Correlation between the Indices of Central bank Independence and Inflation

	Cukierman					Grilli c.s.			AI	E&S	Inflation
	total	inst	app	fin	cons.	total	pol.	econ.			
Cukierman											
total	1.0	0.61	0.20	0.82	0.56	0.79	0.73	0.52	0.62	0.55	-.56
instrument		1.0	0.04	0.38	0.15	0.52	0.35	0.49	0.58	0.44	-.59
appointment			1.0	0.18	0.08	0.12	0.16	0.02	-.05	-.38	0.11
financial				1.0	0.27	0.70	0.44	0.70	0.42	0.28	-.48
conservative					1.0	0.31	0.49	-.02	0.08	0.43	-.16
Grilli											
total						1.0	0.82	0.78	0.68	0.38	-.63
political							1.0	0.28	0.50	0.41	-.37
economic								1.0	0.59	0.19	-.65
Alesina									1.0	0.69	-.70
E&S										1.0	-.68
t-statistic	-2.70	-2.93	0.45	-2.16	-.63	-2.91	-1.42	-3.12	-3.68	-3.59	

Note. Each correlation or regression is calculated for as much observations as are available of the variables concerned. This implies that the correlation between the sub-indices of the Cukierman-index are based on 18 observations, and that between the Cukierman-indices and the indices of Grilli c.s. are based on 15 observations.
The t-statistic in the last row refers to the t-statistic of the index of central bank independence in the regression of inflation on a constant term and the index of central bank independence concerned.

Table 4 Cross-country Differences in Inflation
cultural dimensions and central bank independence

	Cukierman						Grilli c.s.			AI	E&S
	total	app	inst	fin	cons.		total	pol.	econ.		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Constant	16.90	8.53	11.64	8.57	9.22	16.05	15.26	10.90	14.19	14.86	14.69
term	(11.52)	(4.63)	(7.07)	(5.73)	(3.89)	(7.39)	(9.60)	(7.76)	(9.67)	(9.03)	(9.81)
Power	-0.039	0.073	-0.091	0.040	0.053	-0.056	0.104	0.119	0.168	-0.827	-0.081
Distance	(1.29)	(0.98)	(1.83)	(0.58)	(0.61)	(0.81)	(2.03)	(1.87)	(2.91)	(1.31)	(1.50)
Uncertainty	-.071	-.082	-.008	-.055	-.068	-.053	-.131	-.122	-.147	-.005	.034
Avoidance	(2.97)	(1.66)	(0.26)	(1.25)	(1.13)	(1.42)	(3.86)	(2.61)	(4.37)	(0.16)	(0.90)
Masculinity	.042	.002	.036	.004	.006	.056	.051	.025	.033	.056	-.020
	(2.79)	(0.08)	(2.34)	(0.18)	(0.17)	(2.38)	(3.61)	(1.40)	(2.01)	(2.77)	(1.46)
Central bank	-15.36	0.49	-4.37	0.39	0.32	-1.04	-0.82	-0.79	-1.23	-2.87	-1.73
independence	(7.27)	(0.73)	(4.68)	(0.80)	(0.37)	(3.63)	(6.38)	(3.73)	(6.50)	(5.49)	(5.68)
Conservative						-1.76					
						(1.06)					
R^2(adjusted)	0.78	0,06	0.64	0.01	-0.16	0.49	0.84	0.55	0.80	0.74	0.84
F-statistic	15.62	1,26	8.63	1.04	0.42	4.32	18.71	5.28	15.33	11.82	18.71
P-value	0.00	0.00	0.42	0.79	0.02	0.02	0.00	0.02	0.00	0.00	0.00

Variable added: (a) Cukierman; (b) Appointment; (c) Instrument; (d) Conservative; (e) Financial; (f) Sum of appointment, instrument and financial; conservative as a single variable; (g) GMT total; (h) GMT political; (i) GMT economical; (j) Alesina; (k) Eijffinger and Schaling

Table 5 Determinants of Cross-country Differences in Central Bank Independence: Cukierman's index (total)

A Regressions with cultural variables and one additional variable

		(a)	(b)	(c)	(d)	(e)	(f)
Constant	0.514	0.468	0.586	0.538	0.529	0.461	
term	(4.43)	(3.15)	(4.87)	(4.75)	(4.44)	(4.29)	
Power	-.006	-.007	-.004	-.004	-.005	-.009	-.007
Distance	(1.58)	(1.59)	(1.09)	(1.18)	(1.44)	(2.53)	(2.82)
Uncertainty	-.002	0.001	-.002	0.001	-.000	0.002	-.003
Avoidance	(0.07)	(0.217)	(0.66)	(0.36)	(0.07)	(0.78)	(1.42)
Masculinity	0.001	0.001	0.002	0.001	0.001	-.001	-.000
	(0.88)	(0.73)	(1.39)	(0.85)	(0.75)	(0.51)	(0.39)
Additional		0.008	-.003	-.003	-.019	-.139	0.638
variable		(0.52)	(1.54)	(1.43)	(0.81)	(2.10)	(7.13)
Weak checks							0.491
And balances							(6.47)
No checks							0.340
And balances							(3.73)
R^2(adjusted)	0.14	0.09	0.21	0.20	0.11	0.31	0.64
F -statistic	1.89	1.41	2.15	2.04	2.86	1.55	7.04
P-value	0.18	0.28	0.13	0.15	0.07	0.25	0.00

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute value of t-statistics.

Table 5 (continued)

B Regressions with power distance and one additional variable

Constant term	0.568 (5.98)	0.545 (4.86)	0.618 (6.02)	0.605 (6.20)	0.583 (6.01)	0.483 (5.28)	
Power Distance	-.005 (2.25)	-.006 (2.23)	-.005 (2.20)	-.003 (1.13)	-.005 (1.80)	-.007 (3.11)	-.004 (2.50)
Additional variable		0.005 (0.42)	-.002 (1.21)	-.025 (1.28)	-.020 (0.91)	0.116 (2.34)	0.667 (8.86)
Weak checks and balances							0.531 (8.02)
No checks and balances							0.392 (4.85)
R^2(adjusted)	0.19	0.15	0.21	0.22	0.18	0.37	0.63
F -statistic	5.05	2.48	3.32	3.46	2.91	4.08	5.97
P-value	0.04	0.12	0.06	0.06	0.09	0.04	0.01

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

C Regressions with constant term, power distance, uncertainty avoidance and two additional variables

P-values of cultural variables (number of cases)

	P<1%	1%<P<5%	5%<P<10%	P>10%
Power Distance	7	2	4	3
Uncertainty Avoidance	0	1	1	14

Table 6 Determinants of Cross-country Differences in Central Bank Independence
Cukierman's index (appointment)

A. Regressions with cultural variables and one additional variable

		(a)	(b)	(c)	(d)	(e)	(f)
Constant	1.742	1.481	1.444	1.811	1.600	1.708	
term	(2.99)	(2.00)	(2.33)	(3.04)	(2.67)	(2.81)	
Power	.004	-.002	-.003	.008	-.005	.003	-.000
Distance	(0.24)	(0.10)	(0.16)	(0.44)	(0.25)	(0.17)	(0.01)
Uncertainty	-0.013	-0.081	-0.006	-0.010	-0.007	-0.014	-0.009
Avoidance	(0.95)	(0.48)	(0.41)	(0.66)	(0.47)	(0.97)	(0.58)
Masculinity	0.018	0.017	0.015	0.018	0.012	0.019	0.014
	(2.27)	(2.04)	(1.75)	(2.20)	(1.18)	(2.23)	(1.61)
Additional		.045	.013	-.086	.369	.046	2.209
variable		(0.59)	(1.24)	(0.78)	(1.00)	(0.38)	(3.12)
Weak checks							1.634
and balances							(2.72)
No checks							1.778
and balances							(2.47)
R^2(adjusted)	0.12	0.08	0.15	0.09	0.12	0.06	0.08
F -statistic	1.76	1.35	1.76	1.44	1.57	1.28	1.31
P-value	0.20	0.31	0.20	0.28	0.24	0.33	0.32

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 7 Determinants of Cross-country Differences in Central Bank Independence
Cukierman's index (instrument)

A Regressions with cultural variables and one additional variable

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	0.294 (0.73)	0.292 (0.56)	0.586 (4.87)	0.360 (0.89)	0.148 (0.37)	0.372 (0.93)	
Power Distance	-.023 (1.89)	-.023 (1.58)	-.004 (1.09)	-.019 (1.52)	-.033 (2.47)	-.021 (1.74)	-.025 (2.28)
Uncertainty Avoidance	0.018 (1.91)	0.019 (1.57)	-0.002 (0.66)	0.021 (2.16)	0.025 (2.45)	0.021 (2.16)	0.026 (2.88)
Masculinity	0.001 (0.23)	0.001 (0.21)	0.002 (1.40)	0.000 (0.18)	0.005 (0.76)	0.000 (0.04)	-0.003 (0.57)
Additional variable		.000 (0.00)	-.003 (1.54)	-.082 (1.10)	-.379 (1.54)	-.104 (1.32)	0.512 (1.22)
Weak checks and balances							0.260 (0.733)
No checks and balances							-.237 (0.556)
R^2(adjusted)	0.14	0.07	0.21	0.15	0.21	0.18	0.35
F -statistic	1.90	1.32	2.15	1.75	2.16	1.94	2.86
P-value	0.18	0.31	0.13	0.20	0.13	0.16	0.06

Table 7 (continued)

B. Regressions without Masculinity

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	0.323 (0.40)	0.306 (0.55)	0.772 (2.19)	0.384 (1.03)	0.118 (0.30)	0.377 (1.04)	
Power Distance	-.024 (2.07)	-.024 (1.80)	-.018 (1.80)	-.020 (1.66)	-.028 (2.42)	-.021 (1.86)	-.023 (2.27)
Uncertainty Avoidance	0.020 (2.39)	0.020 (2.03)	0.015 (2.06)	0.023 (2.65)	0.020 (2.53)	0.021 (2.61)	0.023 (3.15)
Additional variable		.003 (0.05)	-.015 (2.71)	-.083 (1.15)	.264 (1.38)	-.104 (1.39)	0.409 (1.11)
Weak checks and balances							0.211 (0.63)
No checks and balances							-.276 (0.68)
R^2(adjusted)	0.19	0.13	0.43	0.21	0.24	0.24	0.39
F -statistic	3.02	1.88	5.31	2.50	2.77	2.79	3.69
P-value	0.08	0.18	0.01	0.10	0.08	0.08	0.03

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 8 Determinants of Cross-country Differences in Central Bank Independence Cukierman's index (financial)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	3.437	3.423	3.836	3.690	2.978	3.653	
	(3.94)	(3.04)	(4.09)	(4.71)	(3.91)	(4.46)	
Power Distance	-.031	-.031	-.021	-.016	-.060	-.025	-.041
	(1.16)	(0.98)	(0.77)	(0.65)	(0.12)	(0.99)	(2.00)
Uncertainty avoidance	-0.017	-0.016	-0.026	-0.004	0.003	-0.011	0.002
	(0.27)	(0.65)	(1.17)	(0.21)	(0.17)	(0.54)	(0.15)
Masculinity	0.019	0.019	0.023	0.018	-0.002	0.016	0.005
	(1.55)	(1.45)	(1.84)	(1.64)	(0.70)	(1.40)	(0.50)
Additional variable		.024	-.017	-.313	1.191	-.287	4.622
		(0.02)	(1.10)	(2.17)	(2.53)	(1.79)	(5.84)
Weak checks and balances							3.189
							(4.76)
No checks and balances							2.686
							(3.34)
R^2(adjusted)	0.21	0.15	0.22	0.37	0.43	0.32	0.54
F -statistic	2.50	1.74	2.20	3.54	4.19	2.96	5.04
P- value	0.10	0.20	0.13	0.04	0.02	0.06	0.01

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistic

Table 9 Determinants of Cross-country Differences in Central Bank Independence Cukierman's index (conservative)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	0.830	0.459	0.804	0.825	0.820	0.804	
	(3.41)	(1.75)	(2.95)	(3.24)	(3.16)	(3.21)	
Power Distance	-.012	-.021	-.013	-.012	-.013	-.013	-.012
	(1.65)	(2.84)	(1.59)	(1.57)	(1.49)	(1.70)	(1.71)
Uncertainty Avoidance	0.002	0.010	0.003	0.002	0.003	0.001	0.005
	(0.38)	(1.62)	(0.43)	(0.31)	(0.40)	(0.25)	(0.90)
Masculinity	-0.003	-0.004	-0.003	-0.003	-0.003	-0.002	-0.004
	(0.80)	(1.41)	(0.81)	(0.76)	(0.70)	(0.67)	(1.20)
Additional variable		.064	.001	-.006	.026	.034	0.806
		(2.37)	(0.24)	(0.14)	(0.16)	(0.70)	(3.06)
Weak checks and balances							0.845
							(3.78)
No checks and balances							0.491
							(1.83)
R^2(adjusted)	0.11	0.33	0.04	0.04	0.04	0.07	0.26
F -statistic	1.66	3.06	1.18	1.16	1.17	1.32	2.22
P-value	0.22	0.06	0.37	0.37	0.37	0.31	0.12

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 10 Determinants of Cross-country Differences in Central Bank Independence Cukierman's index (Sum of appointment, instrument and financial)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	4.897 (4.13)	4.806 (3.45)	5.409 (4.80)	5.642 (5.57)	4.277 (4.99)	4.909 (5.49)	
Power Distance	-.023 (0.43)	-.054 (0.84)	.012 (0.25)	.002 (0.05)	-.090 (2.19)	.014 (0.32)	-.037 (1.45)
Uncertainty Avoidance	-0.020 (0.53)	-0.009 (0.21)	-0.050 (1.38)	-0.003 (0.11)	0.022 (0.76)	-0.024 (0.80)	0.008 (0.43)
Masculinity	0.040 (2.52)	0.045 (2.76)	0.062 (3.46)	0.042 (3.15)	-0.004 (0.24)	0.047 (3.85)	0.007 (0.97)
Additional variable		.107 (0.52)	-.048 (2.40)	-.553 (2.97)	2.491 (4.65)	-.587 (3.36)	7.473 (5.084)
Weak checks and balances							5.084 (9.65)
No checks and balances							4.246 (6.79)
R^2(adjusted)	0.22	0.26	0.40	0.52	0.69	0.57	0.85
F -statistic	2.56	2.51	3.78	5.52	10.33	6.73	20.07
P-value	0.10	0.10	0.03	0.01	0.00	0.00	0.00

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 11 Determinants of Cross-country Differences in Central Bank Independence GMT-index (total)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant	9.638	9.587	15.248	13.684	6.426	8.599	
term	(4.32)	(1.77)	(5.70)	(5.19)	(3.95)	(5.87)	
Power	-.049	.012	.044	-.100	-.084	.040	-.039
Distance	(0.47)	(0.16)	(1.02)	(1.30)	(2.35)	(1.15)	(0.71)
Uncertainty	-0.019	-0.063	-0.100	0.091	0.021	-0.035	0.097
Avoidance	(0.24)	(1.06)	(2.83)	(1.76)	(0.69)	(0.85)	(2.95)
Masculinity	0.048	0.049	0.034	-0.013	-0.019	0.053	-0.028
	(1.19)	(1.08)	(0.92)	(0.38)	(0.73)	(1.68)	(1.56)
Additional		-.025	-.144	-.313	3.898	-.862	9.675
variable		(0.04)	(5.23)	(2.17)	(4.10)	(1.75)	(4.20)
Weak checks							6.473
and balances							(3.61)
No checks							1.795
and balances							(0.53)
R^2(adjusted)	0.10	-0.00	0.73	0.71	0.52	0.42	0.91
F -statistic	1.54	1.00	10.50	9.58	4.71	3.54	30.93
P-value	0.26	0.46	0.00	0.00	0.02	0.05	0.00

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 12 Determinants of Cross-country Differences in Central Bank Independence GMT-index (political independence)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	3.857 (2.64)	5.59 (2.59)	6.623 (2.48)	6.170 (3.31)	2.342 (1.96)	3.748 (3.02)	
Power Distance	-.083 (1.39)	-.031 (0.43)	-.044 (0.66)	-.083 (1.57)	-.068 (1.43)	-.057 (0.91)	-.046 (0.85)
Uncertainty Avoidance	0.035 (0.79)	-0.009 (0.16)	-0.019 (0.46)	0.056 (1.44)	0.025 (0.71)	0.003 (0.07)	0.052 (1.24)
Masculinity	0.021 (0.93)	0.026 (1.18)	0.021 (0.60)	-0.000 (0.00)	0.005 (0.28)	0.036 (1.53)	-0.007 (0.41)
Additional variable		-.240 (1.07)	-.046 (1.73)	-.529 (2.23)	1.565 (2.46)	.035 (0.12)	3.986 (1.67)
Weak checks and balances							2.790 (1.80)
No checks and balances							-.411 (0.10)
R^2(adjusted)	0.10	0.18	0.41	0.35	0.35	0.14	0.00
F -statistic	1.59	1.76	3.40	2.86	2.89	1.57	6.92
P-value	0.27	0.21	0.05	0.08	0.08	0.26	0.01

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 13 Determinants of Cross-country Differences in Central Bank Independence GMT-index (economic independence)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	4.816 (2.93)	6.163 (1.90)	8.375 (6.29)	5.143 (5.43)	3.419 (2.78)	4.735 (5.70)	
Power Distance	-.007 (0.15)	-.002 (0.02)	.016 (0.52)	.028 (0.99)	-.053 (1.08)	.036 (0.89)	.003 (0.09)
Uncertainty Avoidance	-0.008 (0.24)	-0.022 (0.32)	-0.062 (2.61)	0.026 (1.25)	0.019 (0.60)	-0.011 (0.39)	0.017 (0.77)
Masculinity	0.021 (0.94)	0.026 (1.14)	0.037 (4.08)	0.022 (1.95)	-0.014 (0.75)	0.026 (2.10)	0.006 (0.55)
Additional variable		-.100 (0.26)	-.072 (5.32)	-.757 (4.72)	3.572 (3.25)	-.552 (2.62)	5.430 (5.03)
Weak checks and balances							3.383 (3.70)
No checks and balances							2.122 (1.68)
R^2(adjusted)	-0.16	-0.12	0.74	0.61	0.40	0.54	0.78
F -statistic	0.35	0.64	11.11	6.51	3.33	5.05	10.72
P-value	0.79	0.65	0.00	0.01	0.06	0.02	0.00

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 14 Determinants of Cross-country Differences in Central Bank Independence Index of Alesina

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	1.822	2.370	2.284	1.960	1.486	1.829	
	(2.65)	(2.76)	(3.67)	(2.95)	(2.12)	(2.79)	
Power Distance	-.024	.002	-.007	-.024	-.077	-.018	-.049
	(0.77)	(0.06)	(0.26)	(0.80)	(2.14)	(0.60)	(1.77)
Uncertainty Avoidance	0.011	-0.005	0.000	0.025	0.055	0.020	0.039
	(0.48)	(0.18)	(0.01)	(1.07)	(2.01)	(0.93)	(1.84)
Masculinity	0.015	0.015	0.019	0.014	-0.015	0.009	0.014
	(1.59)	(1.53)	(2.22)	(1.44)	(0.87)	(0.89)	(1.61)
Additional variable		-.129	-.029	-.181	1.075	-.239	1.743
		(1.05)	(2.31)	(1.44)	(1.90)	(1.48)	(2.60)
Weak checks and balances							1.417
							(2.46)
No checks and balances							0.490
							(0.64)
R^2(adjusted)	0.06	0.07	0.31	0.15	0.20	0.16	0.37
F -statistic	1.32	1.28	2.68	1.60	1.94	1.63	2.74
P-value	0.31	0.34	0.09	0.24	0.17	0.24	0.08

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Table 15 Determinants of Cross-country Differences in Central Bank Independence Index of Eijfinger and en Schaling)

		(a)	(b)	(c)	(d)	(e)	(f)
Constant term	3.163 (3.26)	3.373 (1.77)	3.322 (3.22)	2.470 (2.55)	2.901 (3.47)	3.625 (4.02)	
Power Distance	-.072 (1.74)	-.034 (0.45)	-.038 (0.74)	-.054 (1.39)	-.140 (3.27)	-.066 (1.83)	-.044 (1.18)
Uncertainty Avoidance	0.050 (1.69)	0.031 (0.63)	0.034 (1.07)	0.068 (2.23)	0.106 (3.24)	0.081 (2.73)	0.048 (1.88)
Masculinity	-0.008 (0.58)	-0.012 (0.92)	-0.006 (0.40)	-0.011 (0.92)	-0.055 (2.64)	-0.033 (1.96)	3.057 (3.09)
Additional variable		-.101 (0.36)	-.029 (1.20)	-.220 (1.17)	1.767 (2.67)	-.649 (.2.06)	2.789 (3.23)
Weak checks and balances							1.939 (2.03)
No checks and balances							0.392 (4.85)
R^2(adjusted)	0.02	-0.06	0.03	0.06	0.33	0.21	0.38
F- statistic	1.08	0.79	1.12	1.26	2.94	2.09	1.08
P -value	0.39	0.55	0.39	0.34	0.07	0.15	0.42

Variable added: (a) Equilibrium unemployment; (b) Debt/GDP (%) 1975; (c) Change of government; (d) Significant change of government; (e) Exchange rate system; (f) checks and balances: strong (in the row Additional variable), weak, and no checks and balances, respectively.

Figures between brackets are the absolute values of the t-statistics.

Austria was a very influential observation before weighting.

Table 16 Determinants of Cross-country Differences in Central Bank Independence
Summary of the results for various indices

	theory	Cukierman					Grilli c.s.			AI	E&S	T
		total	app	inst	fin	cons.	total	pol.	econ.			
Power Distance	-	7		4	1	1	1		1	1		16 0
Uncertainty Avoidance	+			11			1 1		1 1	3		16 2
Masculinity	0									1		1
			4						2	1		7
Equilibrium Unemployment	+					1						1 0
Debt/GDP	+											0
Change	-						1		1			3
Significant	-											0
					1	1	1	1	1	1		6
Exchange Rate Mech.	+	1 1				1			1	1		1 4
Checks & balances	+	2	1		1		1		1	1		7

There are two rows for each explanatory variable. The first row lists the number of significant coefficients that have the theoretically expected sign. The second row lists the number of significant coefficients which are wrongly signed. Since no influence of Masculinity was expected, the first row of Masculinity lists the number of negative coefficients and the second row the number of positive coefficients